Control Arm for the Wheel Suspension of a Motor Vehicle

Specification

The present invention pertains to a control arm for the wheel suspension of a motor vehicle with an arm body made of at least one sheet metal part and at least one pivotal point located on the arm body for the connection to a fixing point on the vehicle body side, whereby the pivotal point is designed as a circular mounting bushing for an elastic bearing element.

Control arms of the type of this class are also called suspension arms and usually consist of single or double steel sheets connected to one another, whereby the sheet construction can be provided in sections to increase the stiffness with corrugations or edgings. The control arms in this case have pivotal points for fixing wheel-related components as well as, in addition, pivotal points for fixing the control arm on the vehicle body side. These pivotal points are usually designed such that a certain mobility, which is created by means of an elastic bearing, for example, by means of rubber elements, is guaranteed in these points. These rubber elements are mounted on the control arm in circular mounting bushings, which, in the state of the art, are connected to the actual arm body in various ways.

For example, auxiliary housings, which are bolted on or riveted on the control arm as separate components, are known. Other types of construction provide for connecting additional sheet metal shells for mounting rubber elements or corresponding mounting bushings to the arm housings, for example, by means of welding operations.

All of the structural measures described have the drawback that the mounting bushings or bearing components to be connected to the arm housing are manufactured in separate production steps and are then to be connected to the actual arm housing. This means an increased number of production steps and mounting steps and increased production costs connected therewith, whereby, moreover, additional components have negative consequences in relation to warehousing costs.

In addition, possibilities of providing two-sheet arm bodies, which consist of upper and lower parts welded to one another, with two-part mounting bushings, as this is disclosed, for example, in Patent Application WO 02/074562 A2, have become known from the state of the art. The drawback of the structural embodiment shown there lies in an increased inaccuracy of the mounting bushing as a result of the split located in the mounting plane.

Therefore, starting from the existing state of the art, the object of the present invention is to design a control arm for the wheel suspension of a motor vehicle in relation to its pivotal points, particularly to the vehicle body, so that a simplified, cost-effective production is guaranteed and the control arm is optimized with regard to its weight.

This object is accomplished according to the present invention in that the wall of the mounting bushing is molded in one piece with the arm body and consists of a bearing area having a ring-shaped design as well as a mounting strap fixed on the arm body.

Due to this structural design, the additional components of the pivotal points, which were needed up to now for the manufacture of the control arms of this class, are omitted; moreover, the manufacture

of the arm body is simplified in that the shaping of the necessary mounting bushing for the elastic bearing element can be performed simultaneously with the transforming of the sheet components used for the arm body.

Special embodiments of the subject of the present invention appear from the features of the subclaims in conjunction with the technical teaching of claim 1.

For the fixing of the mounting strap on the arm body, it has proven to be advantageous if this [strap] is fixed on the arm body by means of welding, gluing, riveting, bolting, clinching or tox clinching. The types of fixing mentioned represent a cost-effective variant of the processing in relation to the necessary manufacturing procedures.

In addition, it has proven to be expedient to design the bearing area and the mounting strap, such that these essentially have identical width dimensions.

Two exemplary embodiments of the subject of the present invention are explained in detail below based on the attached drawings, in which:

Figure 1 shows a partial view of a control arm according to the present invention in the area of the pivotal point in case of a one-sheet embodiment of the arm body, and

Figure 2 shows a partial view of another control arm according to the present invention in the area of the pivotal point in case of a two-sheet embodiment of the arm body.

The arm body 1 of a control arm according to the present invention shown in Figure 1 consists of a steel sheet component, in which a mounting bushing, identified in its entirety by 2, is arranged in a corner area. A schematically shown bearing element 3 in the form of a rubber ring is inserted into the mounting bushing. The mounting bushing 2 consists, as this is evident from Figure 1, of a bearing area 4 of a ring-shaped design as well as a mounting strap 5. In the exemplary embodiment shown, the bearing area 4 and the mounting strap 5 have the same width and are molded in the shape of a strap in the unmolded raw state of the arm body as a component of the latter. Within the framework of the transforming process for manufacturing the final arm body contour, the bearing area 4 has a ring-shaped design, and the mounting strap 5 is molded on such that it comes to lie on the top side of the arm body 1. In a final procedure, the mounting strap 5 is then undetachably connected to the arm body by means of a welding or gluing procedure. The welding procedure can be carried out by means of spot welding. As an alternative to this, welding around the edges of the mounting strap is conceivable.

The exemplary embodiment shown in Figure 2 is distinguished from the one shown in Figure 1 in that here the arm body 1 is composed of a lower sheet 1a and an upper sheet 1b. The upper sheet 1b and the lower sheet 1a are welded to one another. The mounting bushing 2 is embodied as a strap of the lower sheet 1a in the unprocessed state of the arm body 1 and is transformed within the framework of the production process, such that, on the one hand, the bearing area of a ring-shaped design is produced for accommodating an [sic, "eins" is an obvious typo for "eines" - Tr.] elastic bearing element as well as the mounting strap 5 in a complementary manner. In the embodiment shown, the mounting strap 5 comes to lie on the top side of the upper sheet 1b and, similar to the view in Figure 1, is fixed here by means of gluing, welding or riveting on the upper sheet 1b.

List of Reference Numbers

1	Arm body
1a	Lower sheet
1b	Upper sheet
2	Mounting bushing
3	Bearing element
4	Bearing area
5	Mounting strap